

# ROBOTICS JUNIOR LEVEL

Robotics in agriculture enhances efficiency and productivity. Key applications include:

**Automated Harvesting:** Robots equipped with sensors and AI can pick fruits and vegetables, reducing labor costs and increasing speed.

**Precision Farming:** Autonomous tractors apply fertilizers, pesticides, and water with precision, optimizing resource use and minimizing waste.

**Planting and Seeding:** Robots ensure accurate planting and seeding, improving crop yields and reducing manual labor.

## Problem statement:

It is essential for the younger generation to understand the practical challenges of robotic operation in agriculture. To address this, we are organizing a competition where participants create and navigate a robot through a simulated agricultural field, showcasing their skills in controlling the robot and completing a designated arena, by pick and place the plants.

## PRELIMINARY LEVEL

### Video Submission:

- Submit a video or timelapse video (max 2 minutes) showing control of the robot (forward, backward, left, right, pick and place).
- In the video, participants should mention their names, school name, and location, along with the robot specifications.
- Upload the video to a specified platform (e.g., YouTube, Google Drive) and share the link for review.
- Additionally, participants should submit a document (PDF format) on the robot (including construction details, materials used, control mechanisms, type of gripper, etc).
- The video link and document should be sent via email to [bharatteckleague@gmail.com](mailto:bharatteckleague@gmail.com).

## **ZONAL LEVEL**

### **Robot Approval:**

- The robot dimensions should be less than or equal to 40 cm in length and 35 cm in width. And weight should not be more than 5 kilograms.
- The robot can be either wired or wireless, depending on the team's preference and the competition rules.

### **Competition:**

- In the zonal round, teams will control their robot to pick up objects from one side of the arena and place them on the other side, avoiding obstacles and completing the task quickly.
- Every robot should have a picker/gripper to hold and carry objects to their respective points.
- The objects in arena (balls and pipes), weigh between 10 grams to 200 grams. The diameter of balls ranges from 5 cm to 8 cm, and the diameter of pipes ranges from 3 cm to 6 cm.

### **Performance Judging:**

- Teams are evaluated based on their precision, skill in navigating obstacles, and completion time. Faster and more accurate teams will score higher.

## **FINAL LEVEL**

### **Competition:**

- The final level will feature more complex obstacles and challenges compared to the zonal round.
- Two teams will participate simultaneously in one arena but compete individually, starting from opposite ends of the arena.
- The driver must navigate the robot to pick an object from the pickup point and place it at the drop-off point with the navigator's (2<sup>nd</sup> participant) help.
- The robot should be driven by avoiding obstacles and completing the task quickly.
- Teams must complete 2 laps, with different drivers and navigators for each lap.

### **Performance Judging:**

- Teams are evaluated based on their precision, skill in navigating obstacles, and completion time. Faster and more accurate teams will score higher.